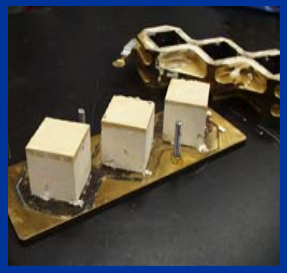
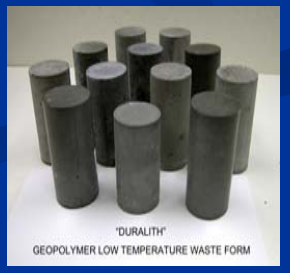
U.S. Department of Energy


# *Impacts of Secondary Waste on Near-Surface Disposal Facility at Hanford*

**Billie Mauss**
**Office of River Protection**

**December 12, 2006**





CH2MHILL Hanford Group, Inc.

Office of River Protection

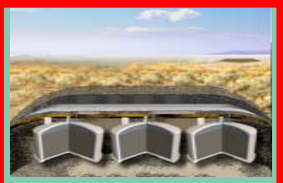
Bechtel National, Inc.

# River Protection Project Mission

***SST Tanks***
**Retrieval**

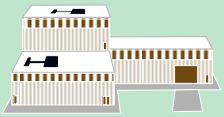
TRUM Processing

**WIPP**
(Outside of RPP Scope)



**Tank Farm Closure**

Supplemental
Pre-Treatment

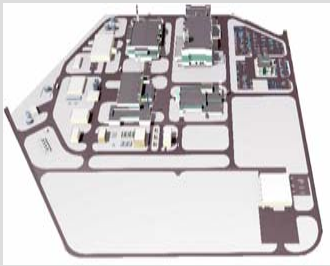


LAW Supplemental
Treatment

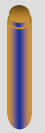
**Integrated**
**Disposal Facility**

**222-S Analytical**
**Services**

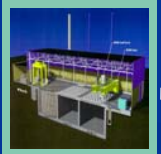
**Waste Treatment &**
**Immobilization Plant**



*ILAW*



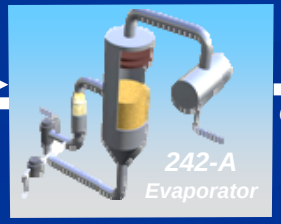
*IHLW*



*Canister*
*Storage*
*Facility*

***Yucca***
***Mountain***
***Repository***
*(Outside of*
*RPP Scope)*

***DST Tanks***
**Retrieval/Waste**
**Feed Delivery**



***242-A***
***Evaporator***

*Condensate*

***ETF***

***Liquid Disposal***

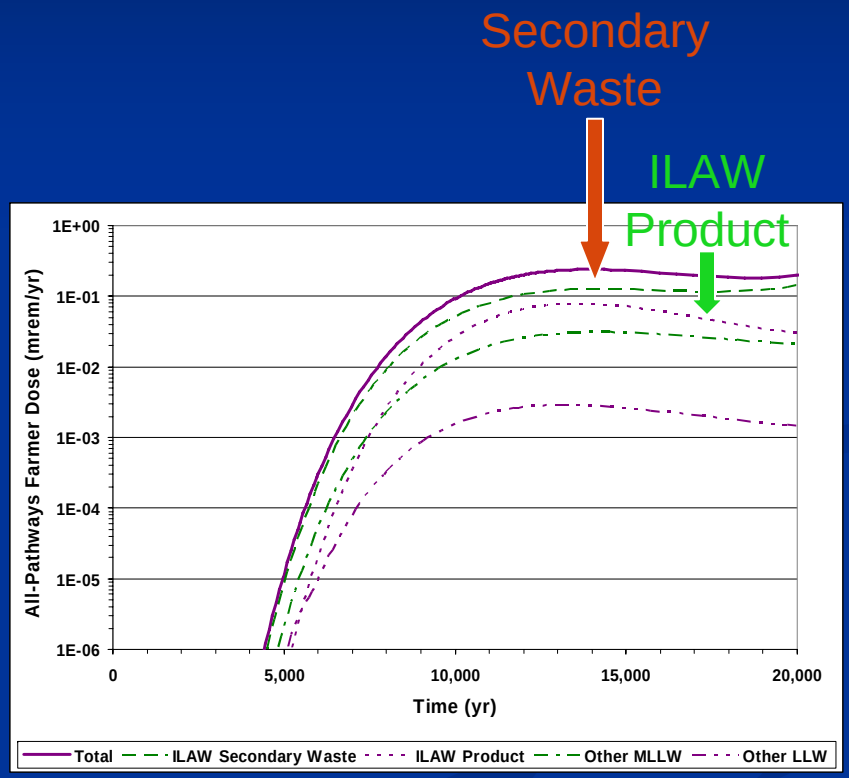
(Outside of RPP Scope)

# Integrated Disposal Facility

- RCRA Permitted Facility for Disposal of:
  - ILAW produced from Low-Activity Waste
  - Secondary Wastes from Immobilization Facilities
  - Other Hanford Site and DOE low-level and mixed low-level waste

# Impacts of Secondary Waste

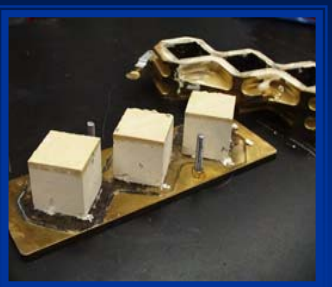
- Assessments have indicated the most significant waste stream for long-term impacts is the secondary waste from the production of ILAW, not the ILAW.



# Low Temperature Immobilization Testing on Secondary Waste

- Problem:
  - Risk analyses show that most of the environmental impact comes from the secondary waste, primarily I-129, which is mostly volatilized during the vitrification processes.
- Need
  - A low-temperature waste form for Secondary Wastes associated with the production of ILAW that would improve the retention of I-129.
  - Standardized methodology for testing Long-Term Performance

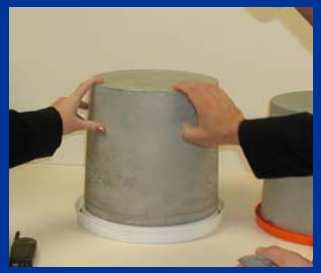
# Low Temperature Immobilization Tests



- **Alkali Aluminosilicate Hydroceramic Cement**: Institute for Clean Energy Technology (ICET) at Mississippi State University

- **Phosphate Bonded Ceramic** (Ceramicrete) - magnesium potassium (Mg-K-$PO_4$) system) : CH2MHILL


- **Alkali Aluminosilicate Geopolymer** ("DuraLith"): Catholic University of America Vitreous State Laboratory (VSL)



- **Cast Stone** (grout): Center for Laboratory Sciences/Columbia Basin College (CLS/CBC)

# Conclusion

- Current assessments show that I-129 from the ILAW secondary waste streams drive the risk to the groundwater however regulatory limits are not exceeded.
- Composition ranges will not be known until actual facility operations.

***Plan for the worst and hope for the best.***